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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/394,745	09/15/1999	Dane K Fisher	38-21(15454)B	4816

7590 09/11/2002

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EXAMINER
KIM, YOUNG J

ART UNIT	PAPER NUMBER
1637	

DATE MAILED: 09/11/2002

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/394,745	FISHER ET AL.	
	Examiner	Art Unit	
	Young J. Kim	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 June 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: Written Description Guidelines, Example 7

DETAILED ACTION

This Office Action responds the Amendment received on June 18, 2002 (Paper No. 13).

Election/Restrictions

Applicants' traversal with regard to the restriction of the claims into a specific combination of 100 SEQ ID Numbers is acknowledged. Applicants are advised that the actual combination of "one hundred" SEQ ID Numbers was selected by Applicants, and was not required by the Examiner. Applicants were requested to elect a single combination of nucleic acids (see Office Action mailed on December 19, 2000, on page 3) to which Applicants have elected the "first one hundred" SEQ ID Numbers as the elected combination (Applicants' response on page 3, Paper No. 6, April 17, 2001). In other words, Applicants could have elected all of the recited SEQ ID Numbers as the combination to be examined. However, it was Applicants who have decided to elect the first 100 SEQ ID Numbers as the elected combination.

It appears that Applicants are traversing the restriction requirement wherein Applicants were required to elect a single combination. If Applicants are traversing that such requirement should not have been made, Applicants are referred to MPEP 803.04, example C, wherein it explicitly states that such combination claims would be subject to restriction requirement wherein Applicants will be required to "select one combination for examination." However, if Applicants are traversing at the fact that only 100 SEQ ID Numbers were examined as the elected combination, Applicants are advised that it was Applicants who have decided to elect the first "one hundred SEQ ID Numbers" as the combination to be examined.

Claim Rejections - 35 USC § 112

The rejection of claims 8-10 under 35 U.S.C. 112, second paragraph, [*as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention*] in the Office Action mailed on March 18, 2002, is withdrawn in view of the claim amendment made in the Amendment received on June 18, 2002.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The rejection of claims 8-11 under 35 U.S.C. 101, [*because the claimed invention lacks patentable utility due to its not being supported by either specific and/or substantial utility or a well established utility*], in the Office Action mailed on March 28, 2002, is maintained for the reasons of record.

Applicants' arguments received on June 18, 2002 have been fully considered but they are not found persuasive for the following reasons.

Applicants state that the Examiner acknowledged that the specification described multiple utilities for the present invention, including for studying genes that are agronomically significant, expression studies, and detection of polymorphisms, but none of such utilities were determined to be substantial or specific.

The utilities disclosed in the specification, such as expression studies, detection of polymorphisms, would be substantial if the expression (or altered expression) of certain nucleic acid, or the presence of certain polymorphism in an individual lead to a diagnosis, a detection of some conditions, or other immediately apparent, real-world utilities.

The instant situation is analogous to that which was addressed in *Brenner v. Manson*, 148 USPQ 689 (1966), wherein the court expressed the opinion that all chemical compounds are "useful" to the chemical arts when this term is given its broadest interpretation. However, the court held that this broad interpretation was not the intended definition of "useful" as it appears in 35 U.S.C. 101, which requires that an invention must have either an **immediately apparent** or fully disclosed "real world" utility (emphasis added). The court held that:

> "The basic quid pro quo contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility...[u]nless and until a process is refined and developed to this point-where specific benefit exists in currently available form there is insufficient justification for permitting an appellant to engross what may prove to be a broad field...a patent is not a hunting license...[i]t is **not a reward for the search**, but compensation for its **successful conclusion**. [emphasis added]

These microarray of the instant application fails to have this substantial utility because the probes on the microarray, by their presence or absence, do not provide a real-world applicability to one ordinarily skilled in the art. The probes (which make up the microarray) as disclosed, do not provide to one of ordinary skill in the art, what their presence or the absence would be useful for. For a probe to have a **substantial or real-world** utility, its presence or absence must relay to the ordinarily skilled artisan a real-world applicable information, such as detection/predisposition of certain conditions (i.e., cancer markers) (emphasis added). A statement indicating that the array of probes has substantial utility because it can, detect polymorphisms would not give an **immediately apparent**, or substantial utility as court has expressed because such apparent utility would not be found without conducting **further research** on each of the claimed polymorphisms (emphasis added). The claimed microarray lacks a substantial utility because the specification of the instant application fails to provide any guidance that the presence/absence of the claimed nucleic acids correlate to some disease,

condition, or presence of harmful agents (i.e., bacteria), etc. The instant application simply relies on the fact that the probes have been patentable in the art and since the claimed microarray comprises probes, it must be patentable. Such reasoning is flawed because nucleic acid probes are not patented solely on their ability to hybridize to their complement. It is the information (a specific benefit, or an immediately applicable benefit) which is gleaned from the hybridization.

Applicants state that the microarray could be used for expression profiling. It is true that a probe (which make up the array) would be found to have an immediately apparent utility if by its over-expression or under-expression, an artisan could derive a useful information (such as diagnostic for conditions). However, Applicants fail to disclose any of such benefit. The artisan using the microarray of the Applicants would not know why the artisan should use the microarray of the claimed probes over other microarray comprising different probes that are isolated from plants, (i.e., maize). Without conducting further research, the artisan would not have any reason, such as an immediately apparent benefit, to use the claimed microarray comprising the recited SEQ ID Numbers.

Applicants state that the use of the claimed microarray could be used to detect presence or absence of polymorphism. However, the specification does not give any example of what polymorphisms could be found using the claimed microarray nor does it disclose what the significance of the polymorphisms would be (i.e., an immediately apparent benefit), such as better crop yield, resistance to herbicides, etc.

Applicants attempt to attribute utility to the claimed microarray through use of a microscope analogy. A microscope, by virtue of the invention, has a real world application in magnifying microscopic objects (that are known to exist) to which the human eyes are not

capable of seeing. The real world application of a probe (on a microarray), however, does not lie in its inherent property of hybridizing to any template. The probe, by its hybridization, must infer useful information. It is that useful information (immediately useful benefit) which would give the probe (therefore, microarray) a substantial utility. The instant application has failed to disclose such information to the artisan.

Applicants attempt to attribute utility to the claimed polynucleotides through the use of a golf club analogy. A golf club would be useful and would have utility in hitting a "golf ball," not any object. Its utility lies in hitting a golf ball. Similarly, the utility of a probe lies in what information it infers. Such information could be, "what does the presence/absence of the nucleic acid indicate," "what is the function of its encoded protein," etc. The instant application has failed to give such guidance to the artisan.

At best, Applicants have provided a microarray comprising probes isolated plants, wherein, each probe of the microarray would require further research to find its substantial utility. For the foregoing reasons, the utility rejection under 35 U.S.C. 101 is maintained.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The rejection of claims 8-11 under 35 U.S.C. 112, first paragraph, [*because the claimed invention is not supported by either a specific and/or substantial asserted utility or a well established utility for the reasons set forth above one skilled in the art would not know how to*

use the claimed invention is maintained], in the Office Action mailed on March 18, 2002, is maintained for the reasons of record.

Applicants' arguments received on June 18, 2002 have been fully considered, but as set forth above, the utility of the claimed microarray is determined to be not established and thus, the rejection is maintained.

The rejection of claims 8-11 under 35 U.S.C. 112, first paragraph, [*as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention*] is maintained for the reasons of record.

Applicants' arguments received on June 18, 2002 have been fully considered, but they are not found persuasive for the following reasons.

Applicants argue that Applicants have provided the nucleotide sequences required by the claims and thus, established possession of the claimed invention.

This argument is not found persuasive because the claims are directed to a microarray comprising nucleic acid molecules that are **complementary** to second nucleic acid molecules **comprising** sequences selected from a combination of elected SEQ ID Numbers.

The issue at hand is whether or not the second nucleic acids are properly described under the 112, first paragraph.

First of all, the SEQ ID Numbers of the elected combination **do not** contain a complete open reading frame (emphasis added). Despite this fact, the claims recite the use of second nucleic acids that **comprise** the SEQ ID numbers, reading on the use of second nucleic acids that

would be a full-length cDNA. Therefore, the claims read on use of nucleic acid sequences that are not described.

Second, the claims are drawn to a microarray comprising nucleic acid molecules that are complementary to the second nucleic acid molecules. As noted above, because the second nucleic acid molecules do not contain full open reading frames, the claims would read on a full-length cDNA sequences that would hybridize to the second nucleic acid. Such claims read on a microarray comprising probes which are full-length cDNAs, containing regions un-described by the specification, rendering the claims improperly described under 112, first paragraph.

Applicants are advised that the rejection is being maintained in accordance with the PTO technology center guidelines (see attached Written Description guideline, example 7).

Finally, Applicants' reference to 227 USPQ 177 (CAFC, 1985), wherein the court expressed that claims "may be broader than the specific embodiment disclosed in a specification," is noted. The statement made by the court was in regard to whether a parent patent application had proper written description support for its subsequent patent claims. In this case, the parent patent clearly had description to support the subsequent patent claims. Although the litigants have argued that the claim language of the subsequent patent which recites the phrase, "protein content of at least about that of solvent extracted soybean meal" was not supported by the language of the parent application, which speaks of "soybean meal having a low fat and high protein content," the court determined that the parent patent had an adequate description because the parent envisioned such limitation:

"[S]uch 50% protein soybean meal is well known and frequently is a by-product of the process of oil extraction from soybeans. Such meal is preferably solvent extracted to decrease

the fat content thereof to the range mentioned above...when, however, the meal has a protein content of substantially less than 50%, it may be mixed with a high protein component which will increase the protein content of the combination to the preferred 50%." (180).

The court has also found that soybean meal of 44%, 50%, 70%, and 90% protein were standard, available commodities in 1964 (filing date of the parent application). Because the parent disclosed a high protein content (with no upper limit) and a preferred lower level with the indication that the protein content could be adjusted, envisioning and supporting the protein content of soybean meal level to above 50%, the court determined that the, "parent's disclosure adequately support[ed] the protein content of the claims in issue" (180).

In the instant case, the claims read on a microarray comprising probes which are full-length cDNAs. However, no prior art disclosures nor the present specification give any guidance in allowing the artisan to arrive at probes that comprise such un-described sequences contained in a full-length cDNA probe, rendering the claims improperly described as required under 35 U.S.C. 112, first paragraph.

No claims are allowed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Inquiries

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Young J. Kim whose telephone number is (703) 308-9348. The Examiner can normally be reached from 8:30 a.m. to 7:00 p.m. Monday through Thursday. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Gary Benzion, can be reached at (703) 308-1119. Papers related to this application may be submitted to Art Unit 1637 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If applicant does submit a paper by FAX, the original copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office. The Fax number is (703) 746-3172. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Young J. Kim

9/5/02

KENNETH R. HORLICK, PH.D
PRIMARY EXAMINER

9/5/02

FICTION

Example 7: EST

Specification: The specification discloses SEQ ID NO: 16 which is a partial cDNA. The specification does not address whether the cDNA crosses an exon/intron splice junction. The specification discloses that this sequence will specifically hybridize with the complement of the coding sequence of a gene of an infectious yeast. The presence of the nucleic acid detected by hybridization with the complement of the coding sequence is useful for identifying yeast infections. Example 1 of the specification describes an experiment where SEQ ID NO: 16 was determined following characterization of a cDNA clone isolated from a cDNA library.

Claim:

An isolated DNA comprising SEQ ID NO: 16.

Analysis:

A review of the full content of the specification indicates SEQ ID NO: 16 is essential to the operation and function of the claimed invention. The specification indicates that the presence of DNA that hybridizes with SEQ ID NO: 16 is indicative of a yeast infection.

A review of the language of the claim indicates that the claim is drawn to a genus, i.e., any nucleic acid that minimally contains SEQ ID NO: 16 within it including any full length gene which contains the sequence, any fusion constructs or cDNAs.

The search indicates that SEQ ID NO: 16 is a novel and unobvious sequence.

There is a single species explicitly disclosed (a molecule consisting of SEQ ID NO: 16 that is within the scope of the claimed genus).

There is actual reduction to practice of the disclosed species.

The disclosure of a single disclosed species may provide an adequate written description of a genus when the species disclosed is representative of the genus. The present claim encompasses full-length genes and cDNAs that are not further described. There is substantial variability among the species of DNAs encompassed within the scope of the claims because SEQ ID NO: 16 is only a fragment of any full-length gene or cDNA species. When reviewing a claim that encompasses a widely varying genus, the examiner must evaluate any necessary common attributes or features. In the case of a partial cDNA sequence that is claimed with open language (comprising), the genus of, e.g., "A cDNA comprising [a partial sequence]," encompasses a variety of subgenera with widely varying attributes. For example, a cDNA's principle attribute would include its coding region. A partial cDNA that did not include a disclosure of any open reading frame (ORF) of which it would be a part, would not be representative of the genus of cDNAs because no information regarding the coding capacity of any cDNA molecule would be disclosed. Further, defining "the" cDNA in functional terms would not suffice in the absence of a disclosure of structural features or elements of a cDNA that would encode a protein having a stated function.

A description of a genus of cDNAs may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to the members of the genus, which features constitute a

substantial portion of the genus. Regents of the University of California v. Eli Lilly & Co., 119 F3d 1559, 1569, 43 USPQ2d 1398, 1406 (Fed. Cir. 1997).

Here, the specification discloses only a single common structural feature shared by members of the claimed genus, i.e., SEQ ID NO: 16. Since the claimed genus encompasses genes yet to be discovered, DNA constructs that encode fusion proteins, etc., the disclosed structural feature does not "constitute a substantial portion" of the claimed genus. Therefore, the disclosure of SEQ ID NO: 16 does not provide an adequate description of the claimed genus.

Weighing all factors, 1) partial structure of the DNAs that comprise SEQ ID NO: 16, 2) the breadth of the claim as reading on genes yet to be discovered in addition to numerous fusion constructs and cDNAs, 3) the lack of correlation between the structure and the function of the genes and/or fusion constructs; in view of the level of knowledge and skill in the art, one skilled in the art would not recognize from the disclosure that the applicant was in possession of the genus of DNAs which comprise SEQ ID NO: 16.

Conclusion: The written description requirement is not satisfied.

Caveat: *In situations where the specification indicates that the SEQ ID NO: is a full-length cDNA open reading frame and the claim* ***cannot*** *read on a gene, the claimed invention would meet the written description requirement.*

Example 8: <u>DNA fragment Encoding a Full Open Reading Frame (ORF)</u>

Specification: The specification discloses that a cDNA library was prepared from human kidney epithelial cells and 5000 members of this library were sequenced and open reading frames were identified. The specification discloses a Table that indicates that one member of the library having SEQ ID NO: 2 has a high level of homology to a DNA ligase. The specification teaches that this complete ORF (SEQ ID NO: 2) encodes SEQ ID NO: 3. An alignment of SEQ ID NO: 3 with known amino acid sequences of DNA ligases indicates that there is a high level of sequence conservation between the various known ligases. The overall level of sequence similarity between SEQ ID NO: 3 and the consensus sequence of the known DNA ligases that are presented in the specification reveals a similarity score of 95%. A search of the prior art confirms that SEQ ID NO: 2 has high homology to DNA ligase encoding nucleic acids and that the next highest level of homology is to alpha-actin. However, the latter homology is only 50%. Based on the sequence homologies, the specification asserts that SEQ ID NO: 2 encodes a ligase.

Claim 1: An isolated and purified nucleic acid comprising SEQ ID NO: 2.